Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application.

1. (Amended) A method for maintaining the integrity of a communication system, comprising:

detecting an impairment on a communication channel of the communication system;

characterizing said impairment as one of a plurality of impairment types; and

adapting operating parameters of the communication system in accordance with said characterization of said impairment.

2. (Original) The method of claim 1, wherein said detecting comprises:

performing a time domain to frequency domain conversion on a signal associated with the communication channel;

aggregating a signal magnitude in the frequency domain;

comparing said signal magnitude at a set of specified frequencies with threshold values each associated with a frequency from said set of specified frequencies; and

reporting a list of frequencies from said set of specified frequencies for which said signal magnitude of an individual frequency exceeds a threshold value associated with said individual frequency.

3. (Original) The method of claim 2, wherein said set of specified frequencies comprises 6 MHz, 12 MHz, 18 MHz, 24 MHz, 30 MHz, and 36 MHz.

4. (Original) The method of claim 3, wherein said set of specified frequencies further comprises 4.5 MHz, 7.5 MHz, 10.5 MHz, 13.5 MHz, 16.5 MHz, 19.5 MHz, 22.5 MHz, 25.5 MHz, 28.5 MHz, 31.5 MHz, 34.5 MHz, and 37.5 MHz.

5. (Original) The method of claim 1, wherein said detecting comprises:

performing a time domain to frequency domain conversion on a signal associated with the communication channel;

aggregating a signal magnitude in the frequency domain;

comparing said signal magnitude aggregated within specified frequency ranges with threshold values each associated with a frequency range from said specified frequency ranges; and

reporting a list of frequency ranges from said specified frequency ranges for which the signal magnitude of an individual frequency range exceeds a threshold value associated with said individual frequency range.

A1

6. (Original) The method of claim 1, wherein said detecting comprises:

performing a time domain to frequency domain conversion on a signal associated with the communication channel;

computing a pulse width and a time between pulses for said signal within one or more frequency ranges; and

detecting a periodic signal within said one or more frequency ranges.

7. (Original) The method of claim 1, wherein said detecting comprises:

examining data packets from the communication channel;

determining whether said data packets contain data errors; and

detecting a period with which data packets containing data errors arrive from the communication channel.

8. (Original) The method of claim 1, wherein said adapting operating parameters comprises scheduling data transmissions at a frequency without said impairment.

9. (Amended) A system for maintaining the integrity a communication system comprising:

an analog receiver that receives analog data from the communication system;

an analog-to-digital converter coupled to said analog receiver that converts said analog data into digitized data;

~~an FFT~~ a fast Fourier transform (FFT) processor coupled to said analog-to-digital converter that receives said digitized data and performs a time domain to frequency domain conversion of said digitized data; and

a processor coupled to said FFT processor that examines said converted digitized data to detect ~~and classify~~ an impairment on a communication channel of the communication system and classify said impairment as one of a plurality of impairment types.

A1

10. (Original) The system of claim 9, wherein said processor detects said impairment by accumulating a magnitude of said digitized data over a period of time at one or more specified frequencies and examines said specified frequencies to determine whether a threshold has been exceeded.

11. (Original) The system of claim 10, wherein said specified frequencies comprise 6 MHz, 12 MHz, 18 MHz, 24 MHz, 30 MHz, and 36 MHz.

12. (Original) The system of claim 11, wherein said specified frequencies further comprise 4.5 MHz, 7.5 MHz, 10.5 MHz, 13.5 MHz, 16.5 MHz, 19.5 MHz, 22.5 MHz, 25.5 MHz, 28.5 MHz, 31.5 MHz, 34.5 MHz, and 37.5 MHz.

13. (Original) The system of claim 9, wherein said processor detects said impairment by comparing a frequency spectrum comprising said digitized data with one or more stored frequency spectra.

14. (Original) The system of claim 9, wherein said processor detects said impairment by examining a frequency band of said digitized data, computes a pulse width and a time between pulses for a DC waveform in said frequency band, and tracks an impulse train from said DC waveform.

15. (Amended) The system of claim 9, further comprising:

an upstream demodulator coupled to said analog-to-digital converter that demodulates said digitized data into demodulated data;

a media access controller coupled to said upstream demodulator that extracts data packets from said demodulated data; and

a memory coupled to said media access controller that stores said data packets in said memory;

wherein said processor ~~identifies~~ detects said impairment by examining said data packets stored in said memory to identify contiguous groups of data packets with errors and data packets without errors and computing a burst period for said contiguous groups of data packets with errors.

16. (Original) The system of claim 15, wherein said processor schedules outgoing transmissions to not coincide with said burst period.

17. (Original) The system of claim 9, wherein said processor schedules data transmissions at a frequency without said impairment.

18. (Amended) An apparatus for maintaining the integrity of a communication system comprising:

receiving means for receiving analog data from the communication system;

converting means for converting said analog data into digitized data;

transforming means for transforming said digitized data from a time domain to a frequency domain; and

processing means for examining said transformed digitized data to detect ~~and classify~~ an impairment on a communication channel of the communication system and classify said impairment as one of a plurality of impairment types.

19. (Original) The apparatus of claim 18, wherein said processing means detects said impairment by accumulating a magnitude of said digitized data over a period of time in one or more specified frequency ranges and examining said specified frequency ranges to determine whether a threshold has been exceeded.

A1

20. (Original) The apparatus of claim 18, wherein said processing means detects said impairment by comparing a frequency spectrum comprising said digitized data with one or more frequency spectra.

21. (Original) The apparatus of claim 18, wherein said processing means detects said impairment by selecting a frequency band of said transformed data, computing a pulse width and a time between pulses for a DC waveform in said frequency band, and tracking an impulse train based on said pulse width and said time between pulses.

22. (Amended) The apparatus of claim 18, further comprising:

demodulating means for demodulating said digitized data into demodulated data;

extracting means for extracting data packets from said demodulated data; and

storing means for storing said data packets;

wherein said processor means ~~identifies~~ detects said impairment by examining said data packets stored in said storing means to identify contiguous groups of data packets with errors and data packets without errors and computing a burst period for said contiguous groups of data packets with errors.

23. (Original) The apparatus of claim 22, wherein said processing means schedules outgoing transmissions to not coincide with said burst period.

24. (Original) The apparatus of claim 18, wherein said processing means schedules data transmissions at a frequency without said impairment.